Installation Guide

NI-3101-SIG Signature Series NetLinx® Integrated Controller

Overview

The NI-3101-SIG Signature Series NetLinx Integrated Controller (**FG2105-08**) satisfies the control and automation features common in a larger area or multiple rooms, which may include the integration of a larger number of devices including VCR and DVD players, projectors, lighting, thermostats and other electronic equipment. In technology-driven environments, this solution allows for the future addition of more devices and control capabilities.

The NI-3101-SIG features an easy-to-install form factor that mounts into 1 unit of rack space and provides extended rack depth to simplify rear connections. Its sleek, gloss black faceplate complements the Tango Distributed Audio line and Metreau Keypads.

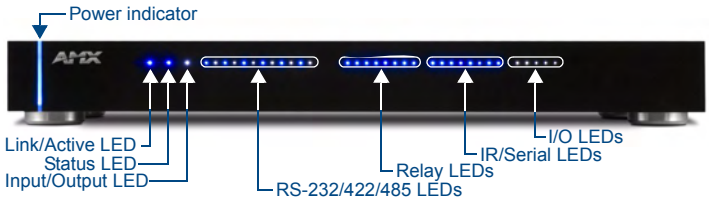


FIG. 1 NI-3101-SIG NetLinx Integrated Controller (front view)

ATTENTION!

*Verify you are using the latest NI firmware for the on-board Master. Verify you are using the latest version of NetLinx Studio (available for download from **www.amx.com**).*

Specifications

NI-3101-SIG Specifications	
Dimensions (HWD):	• 2" x 17" x 10" (5.1 cm x 43.2 cm x 26.35 cm) • 1 RU (rack unit) high
Power Requirement:	900 mA @ 12 VDC
Memory:	• 64 MB SDRAM • 1 MB Non-volatile (NV) SRAM
Compact Flash:	• 128 MB or more • AMX may increase Flash size at any time in response to market availability
Weight:	6.95 lbs (3.15 kg)
Enclosure:	Metal with black matte finish
Certifications:	FCC Part 15 Class B, CE, and IEC 60950
Front Panel LEDs:	
• Power:	Blue LED bar lights when powered up.
• Link/Active:	Blue LED blinks when the Ethernet cables are connected and terminated correctly. Also blinks when receiving Ethernet data packets.
• Status:	Blue LED blinks to indicate that the system is programmed and communicating properly.
• Input/Output:	White LED blinks when the Controller transmits data, sets channels On/Off, sends data strings, etc. Also blinks when it receives data from button pushes, strings, commands, channel levels, etc.
• RS-232/422/485:	6 sets of blue and white LEDs light to indicate the rear DB9 Ports 1 - 6 are transmitting or receiving RS-232, 422, or 485 data.
• Relay:	8 blue LEDs light to indicate the rear relay channels 1 - 8 are active (closed).
• IR/Serial:	8 blue LEDs light to indicate the rear IR/Serial channels 1 - 8 are transmitting control data on Ports 9 - 16.
• I/O:	8 white LEDs light when the rear I/O channels 1-8 are active.
Rear Panel Components:	
• RS-232/422/485 (Ports 1 - 6):	6 RS-232/422/485 control ports using DB9 (male) connectors with XON/XOFF (transmit on/transmit off), CTS/RTS (clear to send/ready to send), and 300-115,200 baud.
• ICSNet:	2 RJ-45 connectors for ICSNet interface (provided by optional ICSNet daughter card).
• ICSHub Out:	RJ-45 connector provides data to a Hub connected to the Controller (provided by optional ICSNet daughter card).
• Relay (Port 8):	• Eight-channel single-pole single-throw relay ports • Each relay is independently controlled. • Supports up to 8 independent external relay devices • Channel range = 1-8 • Each relay can switch up to 24 VDC or 28 VAC @ 1 A • Two 8-pin 3.5 mm mini-Phoenix (female) connectors provide relay • termination

NI-3101-SIG Specifications (Cont.)	
Rear Panel Components (Cont.):	
• Digital I/O (Port 17):	8-channel binary I/O port for contact closure with each input being capable of voltage sensing. Input format is software selectable with interactive power sensing for IR ports.
• IR/Serial (Ports 9 - 16):	8 IR/Serial control ports support high-frequency carriers of up to 1.142 MHz with each output being capable of two electrical formats: IR or Serial. • 8 IR/Serial data signals can be generated simultaneously. • IR ports support data mode (at limited baud rates and wiring distances).
• Program Port:	RS-232 DB9 connector (male) can be connected to a DB9 port on a PC. This connector can be used with serial and NetLinx programming commands, as well as other DB9 capable devices, to both upload/download information from the NetLinx Studio program.
• Configuration DIP Switch:	Sets the communication parameters for the Program port (see *Baud Rate Settings*).
• ID Pushbutton:	Sets the NetLinx ID (Device only) assignment for the device.
• Ethernet Port:	RJ-45 connector provides TCP/IP communication. This is an Auto MDI/MDI-X enabled port, which allows you to use either straight-through or crossover Ethernet cables. The Ethernet Port LEDs show communication activity, connection status, speeds, and mode information: • *SPD (speed)* - Yellow LED lights On when the connection speed is 100 Mbps and turns Off when the speed is 10 Mbps. • *L/A (link/activity)* - Green LED lights On when the Ethernet cables are connected and terminated correctly, and blinks when receiving Ethernet data packets.
• AxLink Port:	4-pin 3.5 mm mini-Phoenix (male) connector that provides data and power to external control devices. Green AXlink LED indicates the state of the AXlink port.
• Power Port:	2-pin 3.5 mm mini-Phoenix (male) connector.
Included Accessories:	• 2-pin 3.5 mm mini-Phoenix (female) PWR connector (41-5025) • 4-pin 3.5 mm mini-Phoenix (female) AXlink connector • (41-5047) • 10-pin 3.5 mm mini-Phoenix (female) I/O connector (41-5107) • Installation Kit (KA2105-02): - 2 rack mount ears - 4 #8-32 Phillips flat head screws • Two 8-pin 3.5 mm mini-Phoenix (female) Relay connectors (41-5083) • 2 CC-NIRC NetLinx IR Emitter Cables (FG10-000-11)
Other AMX Equipment:	• 2-pin 3.5 mm mini-Phoenix male connector (41-5026) • CC-NSER IR/Serial cables (FG10-007-10) • NCK, NetLinx Connector Kit (FG2902) • USB A to B cable (FG10-2105)

Connections and Wiring

FIG. 2 shows the layout of the connectors and components on the rear of the NI-3101-SIG

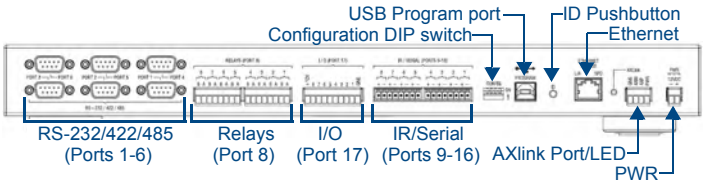


FIG. 2 NI-3101-SIG rear connectors and components

Wiring a power connection

Use a 12 VDC-compliant power supply to provide power to the Controller via the rear 2-pin 3.5 mm mini-Phoenix connector. *Use the power requirements information listed in the Specifications table to determine the power draw.*

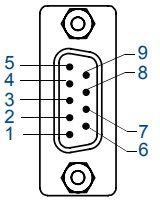
The incoming PWR and GND cable from the PSN power supply must be connected to their corresponding locations within the PWR connector.

- *This unit should only have one source of incoming power.*
- *Using more than one source of power to the Controller can result in damage to the internal components and a possible burn out.*
- *Apply power to the unit only after installation is complete.*

RS-232/422/485 wiring connector information

FIG. 3 shows the pinout and wiring specification information for the rear RS-232/RS-422/RS-485 (DB9) Device Ports. These ports support most standard serial mouse control devices and RS-232 communication protocols for PC data transmission.

The NI-3101-SIG uses Ports 1 - 6.



DB9 Serial Port pinouts (male connector)

RS-232	RS-422	RS-485
Pin 2: RX signal	Pin 1: RX -	Pin 1: A (strap to 9)
Pin 3: TX signal	Pin 4: TX +	Pin 4: B (strap to 6)
PIN 5: GND	PIN 5: GND	PIN 5: GND
Pin 7: RTS	Pin 6: RX +	Pin 6: B (strap to 4)
Pin 8: CTS	Pin 9: TX -	Pin 9: A (strap to 1)

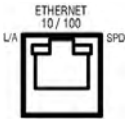
FIG. 3 RS-232/422/485 DB9 (male) connector pinouts

WARNING: *When wiring the 422/485 connections, do* ***NOT*** *use pre-made 9-wire cable or connect the wire in the cable to any connection that will not be used by the DB9 serial port. Only use wiring that connects the needed pins.*

Ethernet 10/100 Base-T Connector

The RJ-45 Ethernet connector provides 10/100 network connectivity between the panel and the NetLinx Master (FIG. 4).

L/A - Link/Activity LED lights (green) when the Ethernet cables are connected and terminated correctly.



SPD - Speed LED lights (yellow) when the connection speed is 100 Mbps and turns Off when the speed is 10 Mbps.

FIG. 4 Layout of Ethernet LEDs

Use a standard CAT5 Ethernet cable to provide communication between the Integrated Controller and external NetLinx devices.

Ethernet Ports Used by the NI-3101-SIG

Ethernet Ports Used		
Port type	**Port #**	**Type**
• FTP	21/20	TCP
• SSH (only *SSH v2 is supported*)	22	TCP
• Telnet	23	TCP
• HTTP	80	TCP
• HTTPS/SSL	443	TCP
• ICSP	1319	UDP/TCP
• integration! Solutions	10500	TCP

Preparing the NI-3101-SIG for Serial Communication

1. Launch NetLinx Studio 2.x (default location is Start > **Programs > AMX ControlDisc > NetLinx Studio 2 > NetLinx Studio 2**).
2. When first connecting to the USB configuration port, follow the Windows® instructions for installing the appropriate USB/Serial port driver.
3. Select **Settings > Master Communication Settings**, from the Main menu, to open the *Master Communication Settings* dialog.
4. Click the **Communications Settings** button to open the *Communications Settings* dialog.
5. Click the **NetLinx Master** radio button (from the *Platform Selection* section) to indicate you are working with a NetLinx Master.
6. Click the **Serial** radio button (from the *Transport Connection Option* section) to indicate you are connecting to the Master via a COM port.
7. Click the **Edit Settings** button (in the *Communications Settings* dialog) to open the *Serial Settings* dialog and set the COM port parameters to: 115.2K baud, N, 8, 1.
8. Click **OK** to close the dialogs to return to the main application.
9. Right-click the *Online Tree* tab entry and select **Refresh System**.

Once Serial communication has been established, use NetLinx Studio to configure the Controller for Ethernet Communication, as described below.

Configuring the NI-3101-SIG for Ethernet Communication

Before continuing, complete the COM port steps above.

1. Use an Ethernet cable to connect the Controller to the LAN to which the PC running NetLinx Studio is connected.

   Note*: NI-3101-SIG Controllers feature an Auto MDI/MDI-X Ethernet port. This provides the option of using either a standard (straight through), or a crossover Ethernet cable to communicate with a PC - both cable types will work.*
2. Select **Diagnostics** > **Network Address** from the menu bar and enter the System, Device *(0 for a Master)*, and Host Name information.
3. To configure the Address:
   - Use a DHCP Address by selecting the **Use DHCP** radio button, then click the **GET IP** button (*to obtain a DHCP Address from the DHCP Server*), click the **SET IP Information** button (*to retain the new address*), and then finish the process by clicking the **Reboot Master** > **OK** buttons.
   - Use a Static IP Address by selecting the **Specify IP Address** radio button, enter the IP parameters into the available fields, then click the **SET IP Information** button (*to retain the pre-reserved IP Address to the Master*), and then click the **Reboot Master** > **OK** buttons to finish the process.
4. Repeat steps 1 - 5 from the previous section, but rather than selecting the **Serial** option, choose **TCP/IP** and edit the settings to match the IP Address you are using (Static or IP).
5. Click on the **Authentication Required** radio box (*if the Master is secured*) and press the **User Name and Password** button to enter a valid username and password being used by the secured Master.
6. Click the **OK** to close all dialogs and return to the main application.

Setting the Configuration DIP Switch

The Configuration DIP switch is used to set the on-board Master to Program Run Disable (PRD) mode, according to the settings listed in the table below:

PRD Mode Settings		
PRD Mode	**Position 1**	ON 1 2 3 4 ON 1 2 3 4
• Normal mode (default)	OFF	
• PRD Mode	ON	

The PRD mode prevents the NetLinx program stored in the on-board Master from running during the device's power-up. This mode should only be used if the resident NetLinx program is causing inadvertent communication and/or control problems.

If necessary, place the on-board Master in PRD mode and use the NetLinx Studio v 2.x program to resolve the communication and/or control problems with the resident NetLinx program.

After doing so, download the corrected program, reset the configuration DIP switch to normal mode, recycle power, and try again.

Onboard WebConsole

NetLinx Masters have a built-in WebConsole that allows you to make various configuration settings via a web browser on any PC that has access to the Master. The webconsole consists of a series of web pages that are collectively called the "Master Configuration Manager".

Accessing the WebConsole

From any PC that has access to the LAN that the target Master resides on:

1. Open a web browser and type the IP Address of the target Master in the Address Bar.
2. Press Enter to access WebConsole for that Master. The initial view is the *WebControl* page.

Additional Documentation

Additional Documentation for the N1-3100 is available at www.amx.com:

- Refer to the *NXI-x100 Series Hardware Reference Guide* for additional details on Installation, Upgrading, and Wiring the NI-3100.
- Refer to the *NI Series NetLinx Integrated Controllers WebConsole & Programming Guide* for detailed configuration instructions.

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